JOURNAL CLUB SUMMARIES

What's hot that the other lot got

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PSEUDOMONAS AERUGINOSA-COMMUNITY ACQUIRED PNEUMONIA: INTERNATIONAL PREVALENCE AND RISK FACTORS

Community acquired pneumonia (CAP) is a major cause of morbidity and mortality worldwide. The contribution of *Pseudomonas aeruginosa* to both disease burden and antibiotic resistance is unclear; Restrepo *et al* (*European Respiratory Journal* 2018;52: 1701190) present a point-prevalence study to address this gap in the data. This multinational study of hospitalised patients investigated the prevalence, risk factors and antibiotic resistance profiles of *P. aeruginosa*-CAP in 54 countries. A total of 3193 patients were included, all had microbiological testing on admission and had a confirmed diagnosis of CAP. Prevalence of *P. aeruginosa*-CAP was 4.2 % (133/3193) which represented 11.3 % (133/1173) of all patients with a positive bacterial culture result. Almost half of these patients had an antibiotic-resistant strain (64/133, 48 %; 2.0 % of total cohort) and a quarter had a multi-drug resistant strain of *P. aeruginosa* (33/133, 25 %; 1.0 % of total cohort). Prior *Pseudomonas* infection/colonisation (OR 16.10, 95% CI 9.48 to 27.35), prior tracheostomy (OR 6.50, 95% CI 2.61 to 16.19), bronchiectasis (OR 2.88, 95% CI 1.65 to 5.05), patients requiring invasive respiratory and/or vasopressor support (OR 2.33, 95% CI 1.44 to 3.78) and very severe chronic obstructive pulmonary disease (COPD) (OR 2.67, 95% CI 1.25 to 6.06) were all independent risk factors associated with the development of *P. aeruginosa*-CAP. The study suggests that the risk of *P. aeruginosa*-CAP is low in hospitalised patients with a diagnosis of CAP but identifiable risk factors may be used to help direct anti-pseudomonal antibiotic therapy.

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HIGH RISK OF INVASIVE ASPERGILLOSIS IN PATIENTS ADMITTED TO CRITICAL CARE WITH INFLUENZA

Bacterial pneumonia is a major complication of influenza and secondary infections are the main cause of death in this patient cohort. Recently, pulmonary aspergillosis, historically associated with immunocompromised patients, has been reported as a potential complication of influenza in those admitted to intensive care units (ICU) without other risk factors. Schauwvlieghe *et al* (*The Lancet Respiratory Medicine* 2018;10:782) used a retrospective multicentred (seven ICU's in Belgium and the Netherlands) cohort design to study the epidemiology and outcome of invasive pulmonary aspergillosis in ICU patients and the aetiological role of influenza in its development. A total of 432 patients admitted with influenza were included and compared with 315 influenza negative pneumonia ICU patients. Nineteen per cent of patients admitted with influenza were identified as having invasive pulmonary aspergillosis (83/432) of whom 46% had an identified host factor. Influenza was reported as an independent risk factor associated with invasive pulmonary aspergillosis (adjusted OR 5.19, 95% CI 2.63 to 10.26; p<0.0001). The incidence of invasive pulmonary aspergillosis was significantly higher in non-immunocompromised patients with severe influenza when compared with the control group (14% vs 5%). This study indicates that invasive pulmonary aspergillosis should be recognised as a complication of influenza in critically ill patients, therefore, an aggressive diagnostic approach should be pursued although the value of early intervention has yet to be established.

CLINICAL EFFICACY BUT MICROBIOLOGICAL UNCERTAINTY WITH AZITHROMYCIN TO TREAT PSEUDOMONAL COLONISATION IN CYSTIC FIBROSIS

Pseudomonas aeruginosa is an important pathogen that commonly infects the lower airways of people with cystic fibrosis (CF) and causes pulmonary exacerbations. Early treatment with antipseudomonal antibiotics, such as tobramycin inhalation solution (TIS), is the current standard of care. The duration of benefit of long-term azithromycin and risks in children with CF remain unclear. Mayer-Hamblett *et al* (*AJRCCM* 2018;198:1177) present the results of a randomised placebo controlled clinical trial investigating the effects of the addition of azithromycin to TIS on pulmonary exacerbations in children with CF and recent *Pseudomonas* colonisation. Planned study treatment duration was 18 months but the trial was stopped early due to efficacy. A total of 221 children (aged 6 months to 18 years) were enrolled and randomised 1:1 to either receive azithromycin three times per week or a placebo. All participants received standard therapy with TIS at initiation. A reduction in risk of pulmonary exacerbations was observed in azithromycin group by 44% (HR 0.56; 95% CI 0.37 to 0.83; p=0.004). Importantly, azithromycin was found to be safe; extensive side effect data were collected with no reported cases of sensorineural deafness in the azithromycin group and a lower rate of electrocardiography abnormalities compared with placebo (0.9% vs 6.3%). With the exception of weight, no other significant differences were observed in important clinical endpoints including lung function. Interestingly from a mechanistic perspective, there was no difference in detected *Pseudomonas* recurrence rates between groups. The authors conclude that this trial suggests that azithromycin may be viable option for children with CF and early *Pseudomonas* infection. Concerns pertaining to the development of macrolide resistance and the acquisition of non-tuberculous mycobacteria with the use of long-term azithromycin still require further examination.

IMPACT OF INFLUENZA-RELATED PAEDIATRIC ADMISSIONS AND VACCINATION RATES IN AUSTRALIA

Influenza is a common cause of viral upper respiratory tract infections worldwide. Young children have the highest rates of hospitalisation due to influenza; Blyth *et al* (*Clinical Infectious Diseases* 2018;ciy597: doi.org/10.1093/cid/ciy597) report the epidemiology of hospitalisation in children with confirmed influenza in Australia. Risk factors associated with severe disease and prolonged hospital length of stay (LOS) were also investigated. As were vaccine coverage and vaccine effectiveness. A total of 1268 children were admitted with PCR-confirmed influenza in 2017. The majority of children requiring hospitalisation were aged <5 years (57.8%) and had no comorbidities

(54.9%). 14.5% required ICU admission (184/1268) but in-hospital case fatality rate was only 0.3%. Risk factors associated with ICU admission included age; young infants aged <6 months (OR 1.97; 95% CI 1.21 to 3.20; p=0.006) and comorbidities (OR 2.29; 95%CI 1.60 to 3.26; p<0.001). Median LOS was 3 days (IQR, 1–5 days); risks associated with a prolonged stay included ICU admission (OR 3.45; 95% CI 2.94 to 4.05; p<0.001), comorbidities (OR 1.34; 95% CI 1.11 to 1.61; p=0.002) and those receiving antivirals (OR 1.76; 95% CI 1.25 to 2.47; p=0.001). Overall vaccine coverage for all children >6 months of age, in which the vaccine in recommended, was low (fewer than one in three) even when provided as part of a fully funded programme and in those with comorbid conditions. After adjustment, the vaccine effectiveness was estimated as 30.3% (95% CI, 2.6% to 50.2%), comparable to the adult population estimate in the same year but lower than previously reported. The authors conclude that these data highlight the significant burden of influenza in childhood and also the challenges with childhood influenza vaccination in Australia.

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